



## LETTERS

edited by Jennifer Sills

## Chile's Research Planning Falls Short

FOR YEARS, CHILE'S POLITICIANS AND ECONOMISTS HAVE TALKED ABOUT THE NEED to increase scientific research to become a developed nation. However, indicators of governmental performance and research policy in Chile, especially when compared with other Organization for Economic Co-operation and Development (OECD) countries—an organization that Chile has only recently joined—indicate poor performance in terms of

investment, researchers, and even public promotion and attitudes to research (1–3). In recent years, Chile's scientific community has faced possible cuts in research funding, and the country's graduate students have been exposed to cuts or delays in calls for funding, publication of results about who will receive funding, and even delivery of the associated funding, including essential fellowships and stipends for their professional development.

Politicians, researchers, and even international organizations have criticized Chile's lack of a modern and appropriate government policy for research (4–7).

**Demand for change.** Graduate students from Chilean universities protest for improvements in the management of the Human Capital Program from the government.

The governmental institution responsible for research administration, CONICYT, was created more than 40 years ago, and since then it has been subjected to successive modifications that undermined its autonomy and relevance. For example, in 1973, the Scientific Advisory Council from CONICYT was eliminated and its attributions were transferred to the President of CONICYT (8). The reinstatement of this Council, which would allow direct communication and advice from the scientific community, remains an urgent need (9).

In contrast, Argentina and Brazil have Ministries of Science and Technology. Peru is also working on the creation of a new Ministry of Science, Technology, and Innovation (10). They are not alone; more than half of the countries in the world, including more than 20 countries from the OECD, have a Ministry or Minister for Science (11).

Chile desperately needs to update its national planning for research. We agree with the recommendations of the experts who advise the creation of a Ministry of Science and Technology (4–7). The Ministry should define a new national plan for science and development [the current plan hails from 1988, among the oldest in South America (12)]; facilitate communication between universities, research centers, and industries; improve public management and funding of national scholarship programs; and engage citizens on the value of scientific research.

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## References

1. OECD, OECD Science, Technology, and Industry Scoreboard 2011 ([www.oecd.org/sti/scoreboard](http://www.oecd.org/sti/scoreboard)).
2. United Nations Educational, Scientific, and Cultural Organization (UNESCO), *UNESCO Science Report 2010* (UNESCO Publishing, Paris, 2010).
3. C. Moreno, A. Muñoz, J. L. Luján, in *Cultura Científica en Iberoamérica*, Organización de Estados Iberoamericanos, Fundación Española para la Ciencia y la Tecnología, Red de Indicadores de Ciencia y Tecnología Iberoamericana e Interamericana, Eds. (Fundación Española para la Ciencia y la Tecnología, Madrid, Spain, 2009), pp. 37–56.
4. J. A. Asenjo, J. C. Castilla, J. Maza, R. Vicuña, *An. Acad. Chil. Cien.* **11**, 63 (2009).
5. J. Cristóbal Feller V, *El sistema chileno de fomento a la Ciencia y Tecnología: Una evaluación desde la óptica de distintos protagonistas del quehacer nacional* (Chilean Society of Biology, Santiago, 2011).
6. OECD, The World Bank, *Reviews of National Policies for Education: Tertiary Education in Chile* (OECD Publishing, Paris, 2009), ch. 7, 10.
7. OECD, The World Bank, *Reviews of National Policies for Education: Chile's International Scholarship Programme*, (OECD Publishing, Paris, 2009).
8. Ministry of Education, Chile, Executive Orders N. 116 and N. 668.
9. J. Mullin, R. M. Adam, J. E. Halliwell, L. P. Milligan, in *Science, Technology, and Innovation in Chile* (International Development Research Centre, Ottawa, Canada, 2000), pp. 21–67.
10. "Proponen crear ministerio de ciencia, tecnología e innovación," *Semana Económica*, 13 March 2012 (<http://semanaeconomica.com/articulos/78596-proponen-crear-ministerio-de-ciencia-tecnologia-e-innovacion>) [in Spanish].
11. Libro Blanco Más Ciencia para Chile (<http://issuu.com/mascienciachile/docs/libroblanco2011>) [in Spanish].
12. Republic of Chile, Ministry of Education, *Plan Nacional Ciencia y Tecnología para el Desarrollo* (1988).

## Don't Jump to Conclusions on Fraud

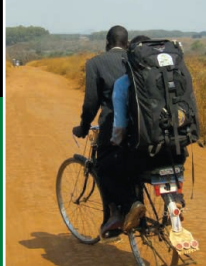
IN THEIR OTHERWISE FINE EDITORIAL "Addressing scientific fraud" (2 December 2011, p. 1182), J. Crocker and M. L. Cooper use unfortunate and ill-advised language when they refer to "the fraudulent work published" by Marc Hauser. Crocker and Cooper rightly criticize Harvard University for keeping secret its findings in the investigation of Hauser. However, stating unreservedly that Hauser has committed fraud is not acceptable. First, all that Harvard has stated is that

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CORRECTIONS AND CLARIFICATIONS

**Review:** "Natural SIV hosts: Showing AIDS the door" by A. Chahroudi *et al.* (9 March, p. 1188). On page 1192, middle column, second full paragraph, the sentence that reads "The SIV<sub>smm</sub> and SIV<sub>mac</sub> (and SIV<sub>agn</sub> and HIV-2, but not SIV<sub>mnd-1</sub> and HIV-1) viruses express Vpx that antagonizes the newly described SAMHD1 host restriction factor..." is incorrect. Instead, it should read: "The SIV<sub>smm</sub> and SIV<sub>mac</sub> (and SIV<sub>mnd-2</sub> and HIV-2, but not SIV<sub>agn</sub>, SIV<sub>mnd-1</sub>, and HIV-1) viruses express Vpx that antagonizes the newly described SAMHD1 host restriction factor..."

**Perspectives:** "Autophagy in tumor immunity" by R. K. Amaravadi (16 December 2011, p. 1501). The term "allograft" was misused to refer to the animal models described in Michaud *et al.* (2) and Noman *et al.* (4). In both papers, syngeneic transplantable tumor models were used as hosts for evaluating the immune responses.

TECHNICAL COMMENT ABSTRACTS

Comment on "Universality in the Evolution of Orientation Columns in the Visual Cortex"

Yicong Meng, Shigeru Tanaka, Chi-Sang Poon  
Kaschube *et al.* (Reports, 19 November 2010, p. 1113) argue that pinwheel density in three mammalian species follows a universal constant of  $\pi$  as predicted by their orientation-selective suppressive long-range connectivity model. We dispute their conclusions and suggest that a simple brain size–pinwheel density scaling law suffices in predicting the self-organized and disorganized orientation maps from primates to rodents.

Full text at [www.sciencemag.org/cgi/content/full/336/6080/413-c](http://www.sciencemag.org/cgi/content/full/336/6080/413-c)

Response to Comment on "Universality in the Evolution of Orientation Columns in the Visual Cortex"

Wolfgang Keil, Matthias Kaschube, Michael Schnabel, Zoltan F. Kisvarday, Siegrid Löwel, David M. Coppola, Leonard E. White, Fred Wolf

Meng *et al.* conjecture that pinwheel density scales with body and brain size. Our data, spanning a 40-fold range of body sizes in Laurasiatheria and Euarchonta, do not support this conclusion. The noncolumnar layout in Glires also appears size-insensitive. Thus, body and brain size may be understood as a constraint on the evolution of visual cortical circuitry, but not as a determining factor.

Full text at [www.sciencemag.org/cgi/content/full/336/6080/413-d](http://www.sciencemag.org/cgi/content/full/336/6080/413-d)

Letters to the Editor

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its secret committee found that Hauser has engaged in unspecified types of "scientific misconduct" (1). Certainly, there are many types of misconduct that do not constitute fraud. Second, Harvard's findings are neither public nor the result of legal review and thus are not definitive. Finally, recent developments call into question the severity of whatever it is that Hauser may have done: Two of the three published studies in question have been repeated, and the results have confirmed the originally published work (2–4). Consequently, scientific fraud does not seem to be the issue involved in these two cases. One has to wonder what the problem was in these and the other cases in question (5–6).

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References

1. G. Miller, "Harvard dean confirms misconduct in Hauser investigation," *ScienceInsider* (<http://news.sciencemag.org/scienceinsider/2010/08/harvard-dean-confirms-misconduct.html>).
2. G. Miller, "Science publishes replication of 2007 Hauser study," *ScienceInsider* (<http://news.sciencemag.org/scienceinsider/2011/04/science-publishes-replication-of.html>).
3. J. N. Wood, M. D. Hauser, *Science* **332**, 537 (2011).
4. M. D. Hauser, J. N. Wood, *Proc. R. Soc. London Ser. B* **278**, 158 (2011).
5. P. Pica, "Accused Harvard scientist should be vindicated," *Real Clear Science* (18 May 2011); [www.realclearscience.com/articles/2011/05/18/accused\\_harvard\\_scientist\\_should\\_be\\_vindicated\\_106238.html](http://www.realclearscience.com/articles/2011/05/18/accused_harvard_scientist_should_be_vindicated_106238.html).
6. J. B. Losos, "The Crimson: Wrong about Hauser," *The Harvard Crimson* (6 September, 2011); [www.thecrimson.com/article/2011/9/6/hauser-misconduct-lad-crimson/](http://www.thecrimson.com/article/2011/9/6/hauser-misconduct-lad-crimson/).

Finding Balance in Fisheries Management

S. M. GARCIA *ET AL.* ("RECONSIDERING THE consequences of selective fisheries," Policy Forum, 2 March, p. 1045) presented a valuable framework for considering how balanced fisheries harvest could improve ecosystem status. However, balanced harvest has some shortfalls as a practical policy, particularly in terms of economic realities and as a method of ecosystem-based management (EBM). Fisheries catch is a function of supply and demand, and most gear types and fishing

efforts target high-value resources (1). Until demand exists for high-biomass and low-price species, a truly balanced fishery is not feasible without subsidies (2) [but see (3)].

In addition, true EBM requires not just balanced fishing, but balanced management of risk across multiple sectors [e.g., integrated ecosystem assessments (4)] to ensure population viability for all species and healthy ecosystems (5, 6). Although Garcia *et al.* considered fishing effects across a suite of fished species, the balanced harvest concept does not factor in fisheries' independent ecosystem needs, such as forage resources for other predators (seabirds, for example) (7).

Furthermore, there will always be a need to protect long-lived, slow-maturing, low fecundity species that are targeted or affected by fishing (8). Marine species experience cumulative impacts and face mortality risks beyond fisheries, and these sources often act disproportionately on specific ecosystem components and life history stages (5, 9). Cumulative impacts can reduce the abundance of these species in the ecosystem to a level that can withstand minimal to no fisheries harvest, necessitating selective fishing.

True EBM requires not just balanced fishing, but balanced management of risk across multiple sectors to ensure population viability for all species and healthy ecosystems.

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References

1. S. A. Sethi, T. A. Branch, R. Watson, *Proc. Natl. Acad. Sci. U.S.A.* **107**, 12163 (2010).
2. D. Pauly *et al.*, *Nature* **418**, 689 (2002).
3. D. Squires *et al.*, *Mar. Pol.* **22**, 135 (1998).
4. P. S. Levin, M. J. Fogarty, S. A. Murawski, D. Fluharty, *PLoS Biol.* **7**, 23 (2009).
5. J. F. Samhouri, P. S. Levin, *Biol. Conserv.* **145**, 118 (2012).
6. E. K. Pikitch *et al.*, *Science* **305**, 346 (2004).
7. P. M. Cury *et al.*, *Science* **334**, 1703 (2011).
8. R. L. Lewison, L. B. Crowder, A. J. Read, S. A. Freeman, *Trends Ecol. Evol.* **19**, 598 (2004).
9. B. S. Halpern *et al.*, *Science* **319**, 948 (2008).